WHAT IS CLAIMED IS:

1. A method for generating an enhanced compressed digital image, comprising the steps of:

a) capturing a digital image;

b) generating additional information relating to the importance of photographed subject and corresponding background regions of the digital image;

c) compressing the digital image to form a compressed digital image;

d) associating the additional information with the compressed digital image to generate the enhanced compressed digital image; and

e) storing the enhanced compressed digital image in a data storage device.

2. The method claimed in claim 1, wherein the additional information generated in step (b) is further compressed to generate compressed additional information before the associating step.

3. The method claimed in claim 2, wherein the step of further compressing the additional information employs a lossless compression technique.

4. The method claimed in claim 1 wherein the digital image is one of a sequence of digital motion images.

5. The method claimed in claim 1 wherein the step of compressing the digital image employs JPEG compression technique.

6. The method claimed in claim 1 wherein the step of compressing the digital image employs JPEG2000 compression technique.

7. The method claimed in claim 1 wherein generating the additional information further comprises the steps of:

b) collecting data from separate sensing elements, wherein all data is collected at the time of capturing the digital image.

8. The method claimed in claim 1 wherein the additional information is a main subject belief map containing a continuum of belief values relating to the importance of the subject and background regions in the digital image.

9. The method claimed in claim 8 wherein generating the main subject belief map comprises the steps of:

a1) extracting regions of homogeneous properties from the digital image;

a2) extracting for each of the regions, at least one structural saliency feature and at least one semantic saliency feature; and

a3) integrating the at least one structural saliency feature and the at least one semantic saliency feature using a probabilistic reasoning engine into an estimate of a belief that each region is the main subject.

10. The method claimed in claim 9 wherein generating the main subject belief map further comprises the steps of:

b) collecting data from separate sensing elements, wherein all data is collected at the time of capturing the digital image; and

c) utilizing the collected data for modifying the estimate of the belief that each region is the main subject.

11. The method claimed in claim 1, further comprising the steps of:

a) extracting the additional information from the enhanced compressed digital image;

b) extracting the compressed digital image from the enhanced compressed digital image;

c) decompressing the compressed digital image to form a decompressed digital image and;

d) further compressing the decompressed digital image responsive to the additional information to generate a recompressed digital image not exceeding a target size.

12. The method claimed in claim 11 where step d) further comprises the steps of:

d1) performing a spatio-frequency transformation on the decompressed digital image to produce an array of transform coefficients;

d2) deriving a distortion-weighting factor from the additional information for each transform coefficient; and

d3) producing a recompressed digital image, not exceeding a target size, using an image compression system that is responsive to the distortion-weighting factors.

13. The method claimed in claim 7, further comprising the steps of:

a) extracting the additional information from the enhanced compressed digital image;

b) extracting the compressed digital image from the enhanced compressed digital image;

c) decompressing the compressed digital image to form a decompressed digital image;

d) generating a main subject belief map from the extracted additional information and the decompressed digital image; and

e) further compressing the decompressed digital image responsive to the main subject belief map to generate a recompressed digital image not exceeding a target size.

14. The method claimed in claim 13 where step e) further comprises the steps of:

e1) performing a spatio-frequency transformation on the decompressed digital image to produce an array of transform coefficients;

e2) deriving a distortion-weighting factor from the belief map for each transform coefficient; and

e3) producing a recompressed digital image, not exceeding a target size, using an image compression system that is responsive to the distortion-weighting factors.

15. A method for recompressing a decompressed digital image using a main subject belief map to generate a recompressed digital image, comprising the steps of:

a) performing wavelet decomposition on the decompressed digital image to produce an array of wavelet coefficients that can be used to reconstruct the decompressed digital image by summing corresponding synthesis basis functions weighted by the wavelet coefficients;

b) deriving a distortion-weighting factor from the belief map for each transform coefficient; and

c) producing a recompressed digital image not exceeding a target size from the wavelet coefficients using the distortion-weighting factors to minimize an error function.

16. The method claimed in claim 15 where step b) further comprises the steps of:

b1) for a wavelet coefficient, identifying a region of support in the belief map corresponding to that wavelet coefficient; and

b2) calculating a distortion-weighting factor for the wavelet coefficient using belief values in the identified region of support.

17. The method claimed in claim 15, wherein the recompressed digital image is JPEG2000 compliant.

18. The method claimed in claim 15, wherein the error function is a mean square error function weighted by the distortion-weighting factors.

19. The method claimed in claim 16, wherein the step b2) of calculating a distortion-weighting factor for the wavelet coefficient is performed by averaging the belief values in the region of support and calculating the distortion-weighting factor as a function of the average belief value.

20. The method claimed in claim 4, further comprising the steps of:

a) extracting the additional information from each enhanced compressed digital image in the sequence;

b) extracting the compressed digital image from each enhanced compressed digital image in the sequence;

c) decompressing each compressed digital image to form a sequence of decompressed digital images; and

d) compressing each decompressed digital image from the sequence, responsive to the additional information, to generate a sequence of recompressed digital images not exceeding a target size.

21. he method claimed in claim 4 wherein generating the additional information for each digital image in the sequence further comprises the steps of:

b) collecting data from separate sensing elements, wherein all data is collected at the time of capturing the digital image.

22. The method claimed in claim 21, further comprising the steps of:

a) extracting the additional information from each enhanced compressed digital image in the sequence;

b) extracting the compressed digital image from each enhanced compressed digital image in the sequence;

c) decompressing each compressed digital image to form a sequence of decompressed digital images;

d) generating a main subject belief map for each digital image from each decompressed digital image and the corresponding extracted additional information;

e) recompressing each decompressed digital image, responsive to the main subject belief map, to generate a sequence of recompressed digital images not exceeding a target size.

23. The method claimed in claim 22, wherein the step e) of recompressing each decompressed digital image in the sequence further comprises the steps of:

a) dividing the decompressed digital image into a plurality of regions; and

b) determining a quantization parameter for each of the regions as a function of the main subject belief values for that region.

24. The method claimed in claim 23, wherein the regions are macroblocks and the sequence of recompressed digital images is MPEG compliant.

25. The method claimed in claim 23, wherein the regions are macroblocks and the sequence of recompressed digital images is H.263 compliant.

26. The method claimed in claim 23, wherein step b) of determining the quantization parameter is performed by averaging the main subject belief values in the region and calculating the quantization parameter as a function of the average belief value.

27. The method claimed in claim 1 wherein the step of generating additional information includes the steps of:

a) calculating a representation of a relative strength of high-frequency components in regions of the image; and

b) compressing and encoding the representation of the relative strength of high-frequency components for inclusion with the compressed digital image.

28. The method claimed in claim 1 wherein the step of generating the additional information comprises the steps of:

a) tracking eye movement, during capture, using eye tracking sensors in a camera viewfinder;

b) generating gaze-tracking data from the eye tracking sensors; and

c) encoding the gaze-tracking data.

29. The method claimed in claim 1 wherein the step of generating the additional information comprises the steps of:

a) capturing a depth map of objects in each frame using a depth sensor;

b) generating depth data from the depth sensor; and

c) encoding the depth data.

30. A system for generating an enhanced compressed digital image, comprising:

a) means for compressing a digital image to form a compressed digital image;

b) means for generating additional information that relates to a photographed subject's importance with regard to the captured digital image, and corresponding background regions of the captured digital image;

c) means for weighing the additional information relative to the photographed subject's importance with regard to the captured digital image such that weighted additional information is produced; and

d) means for associating the weighted additional information with the compressed digital image to produce the enhanced compressed digital image.

31. A system for transcoding an enhanced compressed digital image, comprising:

a) means for extracting additional information from the enhanced compressed digital image;

b) means for extracting a compressed digital image from the enhanced compressed digital image;

c) means for decompressing the compressed digital image to form a decompressed digital image and;

d) means for further compressing the decompressed digital image responsive to the additional information to generate a recompressed digital image not exceeding a bit stream target size.